



Medical Force Protection: Honduras

Medical Force Protection countermeasures required before, during, and after deployment to the "area" are as follows:

Major Threats

Diarrhea, respiratory diseases, injuries, hepatitis A, dengue fever, leptospirosis, rabies, Brucellosis, malaria, other arthropod-borne infections, sexually transmitted diseases, heat injury, and Chaga's disease. Raw sewage, industrial wastes, agrochemicals, and salt-water intrusion may contaminate water.

Requirements before Deployment

1. **Before Deploying report to Medical to:**
 - a. Ensure your Immunizations are up to date, specific immunizations needed for area: **Hepatitis A, MMR, Polio, Typhoid, Yellow fever, Tetanus (Td), and Influenza.**
 - b. If you have not been immunized against Hepatitis A (two dose series over 6 months) get an injection of Immunoglobulin with the initial Hepatitis A dose.
2. **Malaria Chemoprophylaxis:**

Must include Primaquine terminal prophylaxis (see "Requirements after deployment")

 - a. **Chloroquine 500 mg/week 2 weeks prior to entering Honduras, and until 4 weeks after departure.**
 - b. **Mefloquine 250 mg/week 2 weeks prior to entering Honduras, until 4 weeks after departure**
 - c. **Doxycycline 100 mg/day 2 days prior to entering Honduras, until 4 weeks after departure.**
3. **Get HIV testing if not done in the past 12 months.**
4. **Make sure you have or are issued from unit supply: DEET, permethrin, bednets/poles, sunscreen and lip balm. Treat utility uniform and bednet with permethrin.**

Requirements during Deployment

1. Consume food, water, and ice only from US-approved sources; **"Boil it, cook it, peel it, or forget it".**
2. Involve preventive medicine personnel with troop campsite selection.
3. Practice good personal hygiene, hand-washing, and waste disposal.
4. Avoid sexual contact. If sexually active, use condoms.
5. Use DEET and other personal protective measures against insects and other arthropod-borne diseases. Personal protective measures include but are not limited to proper wear of uniform, use of bed nets, and daily "buddy checks" in tick and mite infested areas.
6. Minimize non-battle injuries by ensuring safety measures are followed. Precautions include hearing and eye protection, enough water consumption, suitable work/rest cycles, acclimatization to environment, and stress management.
7. Eliminate food/waste sources that attract pests in living areas.
8. Avoid contact with animals and hazardous plants.

Requirements after Deployment

1. Receive preventive medicine debriefing after deployment.
2. Seek medical care immediately if ill, especially with fever.
3. Get HIV and PPD testing as required by your medical department or Task Force Surgeon.
4. Malaria terminal prophylaxis: Primaquine 15 mg/day beginning on day of departure for 14 days, unless G-6 PD deficient.

VECTOR RISK ASSESSMENT PROFILE (VECTRAP): Honduras

Prepared by: Navy Disease Vector Ecology and Control Center
Naval Air Station, Jacksonville, FL 32212-0043
MSG ADDRESS: NAVDISVECTECOLCONCEN JACKSONVILLE FL//MEI//
PH: (904) 542-2424; DSN: 942-2424
FAX: (904) 542-4324; DSN FAX: 942-4324
E-mail: mei@dveccjax.med.navy.mil
<http://dvecc-jax.med.navy.mil/>

1. GEOGRAPHY: Area of 112,088 sq. km (43,277 sq. mi.), or about the size of Tennessee. **Cities - Capital** is Tegucigalpa (642,500 - 1988 est.); San Pedro Sula metropolitan area (327,000). **Terrain** - Mountainous. **Climate** - Tropical to subtropical, depending on elevation.

2. VECTOR-BORNE DISEASES:

a. **Malaria:** *Plasmodium vivax* and *P. falciparum* are present countrywide, including all urban areas. Transmission is year-round below 1000 meters. *Plasmodium vivax* is the most prevalent, with *P. falciparum* averaging only about 5% of the cases country-wide; exceptions include extreme eastern Gracias a Dios Department - along the border with Nicaragua where falciparum cases average 40% - and in northern Honduras in Colon and Cortes Departments (a survey in these two departments in early 1997 found that nearly 25% of the infections detected were falciparum). Other areas where falciparum malaria transmission is significant are Atlantida and Yoro Departments.

Persons vacationing in the sea resorts of Ceiba and Tela or the Bay Islands should also suspect potential transmission and act accordingly.

No cases of chloroquine or Fansidar resistant falciparum malaria have been reported; however, chloroquine resistance is suspected in the northwest (Yoro). The risk of acquiring malaria is considered high without the proper chemoprophylaxis and would result in a serious loss of combat effectiveness.

b. **Dengue fever:** Risk from dengue fever (including Dengue Hemorrhagic Fever/Dengue Shock Syndrome -- DHF/DSS) likely is higher than previously assessed. According to Public Health Officials, there were "nearly 130,000 cases throughout the country" as of late July 1994. As of early August 1995, 3,000 cases of Den-3 were reported. Health officials expressed concern that a major outbreak of DHF/DSS, similar to the one that occurred in Cuba during 1981 (when approximately 24,000 cases of DHS/DSS occurred), could occur in the Honduras. Once acquired, Dengue would cause a serious loss of combat effectiveness. From early January to late August 1998 there have been over 11,000 cases reported with two deaths from the hemorrhagic form. As of late July 1999, there were over 6,000 cases of dengue reported with 47 cases of hemorrhagic fever with 3 deaths. As of November 1999, at least seven adults and children have died from dengue fever, according to the office of the Deputy Health Minister. The total to the November time frame is 54. One death was known to come from San Pedro Sula, in the northern part of the country. As of 29 June, 2002, WHO reported 3,993 cases of dengue fever including 8 deaths and 545 cases of dengue hemorrhagic fever. The regions affected by dengue hemorrhagic fever are Francisco, Morazan, La Paz, Cortes, Olancho, Comayagua, Choluteca, El Paraiso, Yoro, Santa Barbara, and Copan.

c. **American Trypanosomiasis:** Also known as **Chagas' disease**, it is found at moderate levels of endemicity country-wide including urban areas. Its highest concentration is in the central region of Honduras. It is endemic in the southern half of the country and reportedly constitutes a public health problem in the vicinity of Tegucigalpa.

d. **Leishmaniasis:** It is present countrywide at low levels of endemicity in the rural areas. The majority of leishmaniasis cases are cutaneous with only a few cases of visceral leishmaniasis each year (both forms presumably caused by members of the *Leishmania mexicana* complex). Officially reported cases of visceral leishmaniasis (caused by *L. chagasi*) have declined to about 4 annually, mostly from southern rural areas. Unconfirmed reports indicate that a focus of visceral leishmaniasis exists on Tigre Island on the Pacific coast. The risk of acquiring these diseases is considered low. Neither of these diseases would significantly reduce combat effectiveness.

e. **Rabies:** Rabies is enzootic in Honduras, with reservoirs including both wild and domestic animals, incidence of zoonotic rabies reportedly was increasing in the late 1980s.

VECTOR RISK ASSESSMENT PROFILE (VECTRAP): Honduras (continued)

3. DISEASE VECTOR INFORMATION:

a. The main vector of malaria is the mosquito, *Anopheles albimanus*. This crepuscular blood-feeder is primarily exophilic (i.e., prefers outdoors) and exophagic (i.e., prefers to bite outdoors). Preferred breeding habitats are sunlit ponds with emergent vegetation. *An. pseudopunctipennis* and *An. darlingi* are secondary vectors and probably of little importance in transmission.

An. albimanus is reported resistant to the insecticides DDT, Dieldrin, Lindane, Malathion, Fenitrothion, and Propoxur. *An. pseudopunctipennis* is reported resistant to DDT, Dieldrin, Lindane, Malathion, and Propoxur.

b. Dengue fever is transmitted by *Aedes aegypti*. This is a peridomestic mosquito that prefers to breed in artificial containers near human habitations. It is diurnally (i.e., daytime) active and feeds indoors or out, often biting around the neck or ankles. It typically rests indoors after feeding. *Ae. aegypti* is known to be resistant to the DDT, Dieldrin, and Lindane.

c. The main vectors of Chagas' disease are the reduviid bugs, *Rhodnius prolixus* and *Triatoma dimidiata*. *T. nitida* is a secondary vector. *Rhodnius* is by far the better vector, feeding several times a night and defecating profusely during each feeding period. (NOTE: Reduviids transmit Chagas' disease by defecation during blood feeding - pathogen is rubbed into the wound, conjunctiva or mucous membranes)

d. The sand flies, *Lutzomyia* species, are the vectors of leishmaniasis. Most sand flies are active between dusk and dawn and have very limited flight ranges. Likely vector species include *Lu. longipalpus* for visceral, and *Lu. (Nyssomyia)* species for cutaneous leishmaniasis. Sand flies prefer forest floor habitat.

4. DISEASE AND VECTOR CONTROL PROGRAMS:

a. Malaria chemoprophylaxis should be mandatory. Consult the Navy Environmental Preventive Medicine Unit #2 in Norfolk, VA (COMM: 757-444-7671; DSN: 564-7671; FAX: 757-444-1191; PLAD: NAVENPVNTMEDU TWO NORFOLK VA) for the current chemoprophylaxis recommendations. Yellow fever immunizations should be current.

b. The conscientious use of personal protective measures will help to reduce the risk of many vector-borne diseases. The most important personal protection measures include the use of DEET insect repellent on exposed skin, wearing permethrin-treated uniforms, and wearing these uniforms properly. The use of DEET 33% lotion (2 oz. tubes: NSN 6840-01-284-3982) during daylight and evening/night hours is recommended for protection against a variety of arthropods including mosquitoes, sand flies, other biting flies, fleas, ticks and mites. Uniforms should be treated with 0.5% permethrin aerosol clothing repellent (NSN 6840-01-278-1336), per label instructions. NOTE: This spray is only to be applied to trousers and blouse, not to socks, undergarments or covers. Reducing exposed skin (e.g., rolling shirt sleeves down, buttoning collar of blouse, blousing trousers) will provide fewer opportunities for blood-feeding insects and other arthropods. Additional protection from mosquitoes and other biting flies can be accomplished by the use of screened eating and sleeping quarters, and by limiting the amount of outside activity during the evening/night hours when possible. Bednets (insect bar [netting]: NSN 7210-00-266-9736) may be treated with permethrin for additional protection.

c. The most important element of an *Aedes aegypti* control program is SOURCE REDUCTION. Eliminating or covering all water holding containers in areas close to human habitation will greatly reduce *A. aegypti* populations. Alternatively, containers may be emptied of water at least once a week to interrupt mosquito breeding. Sand or mortar can be used to fill tree holes and rock holes near encampments.

d. Because the breeding habitats of most sand fly species are not easily identified, not easily accessible, or unknown, control strategies focus mainly on adult sand flies. Spraying residual insecticides on buildings, (including screening on portals of entry) animal shelters, and other adult resting sites can control Peridomestic sand fly species. Area chemical control of sylvan sand fly species is impractical. Personal protective measures will reduce sand fly bites and environmental modification (e.g., clearing forests, eliminating rodent burrows/breeding sites, relocating domestic animals away from human dwellings) has been used to reduce local sand fly populations.

e. Expanded Vector Control Recommendations are available upon request.

VECTOR RISK ASSESSMENT PROFILE (VECTRAP): Honduras (continued)**5. IMPORTANT REFERENCES:**

Contingency Pest Management Pocket Guide Technical Information Memorandum(TIM)24. Available from the Defense Pest Management Information Analysis Center (DPMIAC) www.afpmb.org/pubs/tims/ (DSN: 295-7479 COMM: (301) 295-7479). Best source for information on vector control equipment, supplies, and use in contingency situations.

Control of Communicable Diseases Manual-Edited by James Chin. Seventeenth Ed. 2000. Available to government agencies through the Government Printing Office. Published by the American Public Health Association. Excellent source of information on communicable diseases.

Medical Environmental Disease Intelligence and Countermeasures-(MEDIC). January 2002. Available on CD-ROM from Armed Forces Medical Intelligence Center, Fort Detrick, Frederick, MD 21702-5004. A comprehensive medical intelligence product that includes portions of the references listed above and a wealth of additional preventive medicine information.

Internet Sites- Additional information regarding the current status of vector-borne diseases in this and other countries may be found by subscribing to various medical information sites on the internet. At the Centers of Disease Control and Prevention home page subscriptions can be made to the Morbidity and Mortality Weekly Report(MMWR)and the Journal of Emerging Infectious Diseases. The address is www.cdc.gov. The World Health Organization Weekly Epidemiology Report (WHO-WER) can be subscribed to at www.who.int/wer. The web site for PROMED is <http://www.promedmail.org/>.

Although PROMED is not peer reviewed, it is timely and contains potentially useful information. The CDC and WHO reports are peer reviewed. Information on venomous arthropods such as scorpions and spiders as well as snakes, fish and other land animals can be found at the International Venom and Toxin Database website at <http://www.kingsnake.com/toxinology/>. Information on anti-venom sources can also be found at that site. Information on Poisonings, Bites and Envenomization as well as poison control resources can be found at www.invivo.net/bg/poison2.html.

USERS OF THIS VECTRAP: Please notify NDVECC Jacksonville, or the appropriate NEPMU, if you acquire any medical entomology information that can be used to update this VECTRAP.

CUSTOMER SURVEY: In order to improve our VECTRAPs we would like your opinions on the quality and quantity of information contained in them. Please take time to fill out the survey which is contained as an attachment and Fax or e-mail your response back to us. Thank you for your cooperation.

ADDITIONAL INFORMATION ON DISEASE VECTOR SURVEYS, CONTROL AND SPECIMEN ID's WILL BE PROVIDED UPON REQUEST.